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EXAMINER	
CLEVELAND, MICHAEL B	
ART UNIT	PAPER NUMBER
1762	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/673,204	STURM ET AL.
	Examiner	Art Unit
	Michael Cleveland	1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 February 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 4 and 9-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4, 22, and 35: The phrase "to reduce the size of the modified area" is unclear. What is the reduction compared to? For purposes of applying art, the claim has been treated as inclusive of substrate heating the produces any size of modified area.

Claim 9-14: The phrase "applying an organic coating having a dopant" in claim 9 is unclear because there is no statement describing to what the coating is applied. The claim was treated as at least inclusive of applying the coating on the substrate.

Claims 15-17: There is no antecedent basis for the terms "the second organic layer" or "the organic second layer". The Examiner assumed the second layer was intended.

Claim 18: The phrase "transferred to second" is unclear. The Examiner assumed the second layer was intended.

Claims 19-27: The phrase "from the first layer to the second layer" is not clear. The first layer does not appear to have the dopant (as in claim 15). Is the claim inclusive of transferring the dopant from on top of the first layer into the second layer? For purposes of applying art, it was so interpreted.

Claims 28-35: The phrase "depositing a dopant or material containing a dopant thereon" is unclear because "thereon" could refer to the "substrate" or "the organic coating". The claim was treated as inclusive of either.

Claim 31: The phrase "liquid droplets are applied by ink jet printing" is unclear because there is no statement describing to what the droplets are applied. The claim was treated as at least inclusive of applying droplets containing the dopant on the organic coating.

Claim 33: The terms "thin" and "close" in claim 34 is a relative term which renders the claim indefinite. The terms are not defined by the claim, the specification does not provide a

standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The term "close contact" is also unclear. Is actual contact required or merely close proximity? The claim was treated as requiring only a degree of proximity.

Claim Objections

3. Claims 14 and 16 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 14 fails to further limit its parent claim because it merely recites that the solvent is applied in a pattern and that the dopant is removed in a pattern. However, any application (or removal), even uniform, is necessarily a pattern. Therefore, claim 14 does not further limit parent claim 10. Likewise, claim 16 requires transfer in "selected areas" . However, such language is inclusive of all areas, and therefore the claim does not further limit its parent.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 9, 11, 13, 15-17, 19, 24-25, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawakami et al. (U.S. Patent 5,673,077, hereafter '077).

Claim 9: '077 teaches

providing a substrate (1) (col. 3, lines 7-27);

applying an organic coating (2) having a colorant (i.e., a dopant) (col. 3, lines 24-65; col. 7, lines 13-34; col. 8, lines 8-13); and

then transferring the colorant (i.e., dopant) into an image-receiving layer (4) (i.e., removing the dopant from areas of the coating) (col. 16, lines 18-30). See Fig. 1.

Claim 11: The colorant may be transferred by heating (i.e., annealing) (col. 16, lines 18-30).

Claim 13: Mask (3 or 6) is patterned on coating (2) before transferring (i.e., removing) the colorant in a pattern (col. 3, lines 21-29; col. 16, lines 18-30; Fig. 1-2).

Claim 15: '077 teaches

providing a first layer (2) having a colorant (i.e., dopant) (col. 3, lines 24-65; col. 7, lines 13-34; col. 8, lines 8-13);

providing an organic (col. 11, line 48-col. 12, line 9) second layer (4) on the first layer (col. 16, lines 18-30); and

transferring the dopant from the first layer to the second layer (col. 16, lines 18-30; Fig. 1).

Claim 16: The colorant is transferred in selected areas (col. 16, lines 18-30; Fig. 1).

Claim 17: Masking means (3) is provided on the first layer prior to providing the second layer (col. 3, lines 21-29; Fig. 1), and the dopant is transferred in areas not masked (Fig. 1).

Claim 19: '077 teaches

providing substrate (1) (a first layer of material) (col. 3, lines 21-29; Fig. 1);

applying a colorant (i.e., dopant) layer (2) in a (uniform) pattern to the first layer (col. 3, lines 24-65; col. 7, lines 13-34; col. 8, lines 8-13);

providing a second layer (4) containing an organic material (col. 11, line 48-col. 12, line 9) on the first layer (col. 16, lines 18-30); and

transferring the dopant from the first layer to the second layer (col. 16, lines 18-30; Fig. 1).

Claims 24-25: The dopant may be a blue dye (Example 1), which changes the color of the film.

6. Claims 9-10 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Pastor et al. (U.S. Patent 4,332,879, hereafter '879).

'879 teaches providing a substrate (26) (col. 4, lines 27-32)

applying an organic coating containing a metal dopant (col. 4, lines 27-55) (The coating may contain another dopant: a sensitizer (col. 5, lines 21-26);

irradiated through a mask, and then developed to remove unwanted portions of the coating (including the metal and sensitizer dopants) (col. 6, lines 3-8). See also Fig. 3.

Claim 10: Development occurs by washing away the undesired portions with a solvent (col. 8, lines 23-25).

Claim 14: The solvent is applied in a uniform pattern, and washes away the photoresist and dopants in the desired pattern.

7. Claims 1-7, 9, 11, 28-31, and 34-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Shirasaki et al. (U.S. Patent 5,895,692, hereafter '692).

Claims 1-7, 28-31, 34, 36: '692 teaches a method of making an organic light-emitting device (col. 1, lines 1-15)

providing a substrate (11);

coating an organic material (16) on the substrate (col. 4, lines 41-60; Figs. 6A-6B); and

applying fluorescent dyes (i.e., dopants) (13a-c) in selected areas to modify the color (i.e., the light-emitting properties) of the film (col. 4, line 61-col. 5, line 8; Figs. 7A-8B);

and causing the dopant to migrate into the organic coating (col. 7, lines 15-36).

Claim 29: The dopant is applied in a pattern and the dopant forms the same pattern after migrating into the organic layer (Figs. 7A-8B; col. 7, lines 15-36).

Claims 2-4, 30-31, 34-35: The dye may be applied by ink-jet printing (col. 7, lines 15-24). The substrate may be heated (col. 7, lines 41-49), and a given modification area is achieved (Fig. 8B).

Claim 5: The dyes may be applied by screen printing (col. 7, lines 15-24).

Claims 6-7: The inks may be red, green, or blue dyes (col. 5, lines 1-8).

Claim 36: The dyes may be applied by screen printing (col. 7, lines 15-24). Screen printing involves depositing a patterned mask on the surface to be printed (in this case, organic

layer (16)), applying the printing ink (in this case, containing the dopant) over the mask and the printing surface. The dyes are then caused to migrate into the organic film in the printed pattern (i.e., in the areas exposed through the screen) (col. 7, lines 15-36; Figs. 7A-8B).

Claim 9: '692 teaches providing a substrate (11);

providing organic coatings having a dopant (13a-c) (col. 4, line 61-col. 5, line 8; Figs. 7A-8B) (The dopant is organic; col. 5, lines 1-8);

and removing the dopant from the entirety of the coatings (in fact, removing the coatings) by diffusing them into underlying layer (16) (col. 4, line 61-col. 5, line 8; Figs. 7A-8B).

Claim 11: The dopant is removed by heating (i.e., annealing) (col. 7, lines 26-36).

8. Claims 1-3, 6-7, 9-10, 14-16, 18-21, 24-25, 28-31, and 33 are rejected under 35 U.S.C. 102(e) as being anticipated by Tang et al. (U.S. Patent 6,066,357, hereafter '357).

Claims 1-3, 6-7, 28-31, 33: '357 teaches a method of making an EL device comprising

providing a substrate (102) (col. 4, lines 1);

coating an organic material (120) thereon to form a thin film (col. 4, lines 6-8);

applying a dopant to areas of the film to modify the properties of the film (col. 4, lines 9-14; Figs. 8A-8D); and

causing the dopant to migrate into the organic coating (col. 4, lines 9-14; Fig. 8E).

Claim 29: The dopant is patterned on substrate (102) and is transferred in the pattern (Figs. 8A-8E).

Claims 2-3, 30-31: The dopants are applied by ink-jet printing (col. 11, lines 23-32).

Claims 6-7: The dopants may be red, green, or blue dyes (col. 13, lines 30-35).

Claim 33: The colorant may be provided by sublimation from a donor support (i.e., foil) in close proximity to the substrate (Fig. 7; col. 9, lines 16-32).

Claims 9-10 and 14: '357 teaches a method of making an EL device comprising

providing a substrate (102) (col. 4, line 1);

applying an organic coating having a dopant (125, 127, 129) (col. 4, lines 9-14; Figs. 8A-8D) (the dopants are organic; col. 10, lines 33-45); and

removing the dopant from the areas of the coating by causing them to migrate from the coating into underlying layer (120) (Fig. 8E; col. 4, lines 9-14).

Claim 10: The dopant is removed by a solvent (col. 10, lines 16-31; col. 11, lines 16-22).

Claim 14: The solvent is applied in a (uniform) pattern, and removes each dopant in a pattern (Fig. 8E).

Claims 15-16 and 18: '357 teaches a method of making an EL device comprising providing a first layer (125, 127, 129) having a dopant (Fig. 10A-10D);

providing a second layer (120) on the first layer (Fig. 10E) (Layer (120) is organic; col. 7, line 63-col. 8, line 11); and

transferring the dopant from the first layer to the second layer (Fig. 10F) (col. 11, lines 23-50).

Claim 16: Each dopant is transferred in selected areas (Fig. 10F).

Claim 18: The first layer with the dopant is patterned on substrate (102) and is transferred in the pattern of the first layer (Figs. 10D-10F).

Claims 19-21, 24-25: '357 teaches a method of making an EL device comprising providing a first layer of material (110) (Fig. 10A);

applying a dopant (125, 127, 129) in a pattern to the first layer (Fig. 10A-10D);

providing a second layer (120) on the first layer (Fig. 10E) (Layer (120) is organic; col. 7, line 63-col. 8, line 11); and

transferring the dopant from the first layer to the second layer (Fig. 10F) (col. 11, lines 23-50).

Claims 20-21: The dopants are applied by ink-jet printing (col. 11, lines 23-32).

Claims 24-25: The dopants may be red, green, or blue dyes (col. 13, lines 30-35).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 4 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki '692 as applied to claims 1 and 30, above, and further in view of Oliver et al. (U.S. Patent 5,551,973, hereafter '973).

'692 is described above. It teaches heating the substrate, but it does not explicitly teach that the inks are deposited on a hot substrate.

However, '973 teaches that ink jet inks may be printed onto heated substrate to evaporate the solvent more quickly (col. 51, line 52-col. 52, line 19). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have printed the inks onto a heated substrate in order to have improved productivity by shortening the drying time. The claimed feature of reduction of the modified area appears to be an inherent feature of such expedited drying. (See applicant's specification at p. 10.)

11. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki '692 as applied to claims 7, above, and further in view of Tamano et al. (U.S. Patent 6,150,042, hereafter '042).

'692 is described above. It teaches that the dopant may be coumarin (col. 5, lines 1-8), but does not also teach the use of nile red.

'042 teaches a number of materials for use as dopants in EL devices. The list (col. 77, line 19-col. 78, line 3) significantly overlaps that of '692, and includes nile red (col. 77, line 66). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used nile red in addition to coumarin as the dopants of '692 with a reasonable expectation of success because '042 teaches that nile red is a dopant suitable for EL devices.

12. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pastor '879 as applied to claim 10, above, and further in view of Dinella (U.S. Patent 3,614,225, hereafter '225).

'879 is discussed above. It teaches irradiating the photoresist through a mask prior to applying the solvent to remove the dopant in a pattern (col. 6, lines 3-8) but does not disclose patterning the mask *on* the coating. In fact, '879 is silent as to the location of the mask.

'225 teaches that the exposure of a photoresist may occur through a mask spaced from the photoresist or directly on the photoresist (col. 1, lines 20-44). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied the mask directly to the photoresist because '225 discloses that such is an operative configuration for exposing a photoresist through a mask.

13. Claims 22-23 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tang '357 as applied to claims 19-20, above, and further in view of Shirasaki '692.

Tang '357 is described above, but does not disclose screen printing, diffusion by annealing, or heating the substrate to reduce the size of the modified area.

However, Shirasaki '692 describes a similar method of preparing EL devices, and the list of dopant of '357 (col. 10, lines 33-46) significantly overlaps that of '692 (col. 5, lines 1-8). '692 teaches screen printing, thermal diffusion, and heating the substrate as described above (relating to claims 4, 5, and 11).

Claims 22 and 27: It would have been obvious to one of ordinary skill in the art at the time the invention was made to have thermally diffused the dopants by the method of '692 instead of the fluid diffusion method of '357 because '692 demonstrates that the same dopants may be thermally diffused, as discussed above (col. , lines 26-37). A method to accomplish this is to heat the substrate (col. 7, lines 41-49).

Claim 23: It would have been obvious to one of ordinary skill in the art at the time the invention was made to have deposited the inks of '357 by screen printing instead of ink-jet printing because '692 discloses that ink-jet printing and screen printing are both operative methods of depositing such inks (col. 7, lines 15-20).

14. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tang '357 as applied to claim 20, above, and further in view of Oliver '973 as applied to claims 4 and 35 above for substantially the same reasons given regarding the expedited evaporation of solvents by depositing ink-jet inks on heated substrates.

15. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tang '257 as applied to claim 25, above, and further in view of Tamano '042.

'357 is described above. It teaches that the dopant may be coumarin (col. 10, lines 33-46), but does not also teach the use of nile red.

'042 teaches a number of materials for use as dopants in EL devices. The list (col. 77, line 19-col. 78, line 3) significantly overlaps that of '357, and includes nile red (col. 77, line 66). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used nile red in addition to coumarin as the dopants of '692 with a reasonable expectation of success because '042 teaches that nile red is a dopant suitable for EL devices.

16. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki '692 as applied to claim 29, above, and further in view of Albertelli (U.S. Patent 6,093,356, hereafter '356).

'692 is described above. It teaches the deposition of dyes or pigments as inks, but does not that the dyes are deposited in the form of a dry powder.

'356 teaches that dyes and powders may be applied to surfaces as dry powders rather than in the form of inks. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have deposited the colorant of '692 as the dry powder of '356 with a reasonable expectation of success and with the expectation of similar results because '356 teaches that they are both operative methods of providing colorants.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Littman et al. (U.S. Patent 5,688,551, hereafter '551) is cited of interest for its teachings regarding the contact of sublimation films with the substrate (col. 5, lines 1-24).

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (703) 308-2331. The examiner can normally be reached on 9-5:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the

organization where this application or proceeding is assigned are (703) 306-3186 for regular communications and (703) 306-3186 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

MBC
December 2, 2002

MICHAEL BARR
PRIMARY EXAMINER